

Brass and Bronze Forging Alloys

Copper Alloy Number	Commercial Designation	Nominal Composition %	Relative Forgeability Rating* %	Mechanical Properties [#]					Physical Properties	
				Tensile Strength psi	Yield Strength psi (1/2%ext.)	Elongation in 2" (%)	Shear Strength psi	Hardness Rockwell B	Relative Machinability Rating** %	Density lb./cu. In. at 68°F
377	Forging Brass	Cu 59.00 Pb 2.00 Zn Bal.	100	58000	23000	40	35500	45	80	0.305
365	Forging Brass	Cu 58.25 Pb 0.50 Zn Bal.	100	59000	24000	35	33000	48	60	0.305
642	Aluminum - Silicon Bronze	Al 7.0 Si 0.85 Cu Bal.	80	75000	35000	32	N/A	77	60	0.278
464	Naval Brass	Cu 60.5 Sn 0.75 Zn Bal.	90	64000	26000	40	42000	55	30	0.304
485	Leaded Naval Brass	Cu 60.5 Sn 0.75 Pb 1.75 Zn Bal.	90	62000	24000	40	38000	55	70	0.305
675	Manganese Bronze Type A	Cu 59.00 Mn 0.15 Sn 1.00 Fe 1.00 Zn Bal.	80	70000	32000	33	43000	69	30	0.302
676	Leaded Manganese Bronze	Same as 676 plus Pb 0.75	80	70000	32000	30	41500	68	60	0.303
674	High Manganese Bronze	Cu 58.00 Mn 3.00 Si 1.00 Al 2.00 Zn Bal.	90	80000	40000	18	N/A	80	25	0.292
673	Leaded High Manganese Bronze	Cu 59.50 Mn 2.50 Si 1.00 Pb 1.25 Zn Bal.	75	Heat 82000	Treated 48000	14	N/A	84	60	0.299
670	Manganese Bronze Type B	Cu 64.25 Mn 2.50 Fe 3.50 Al 5.25 Zn Bal.	80	62000	24000	40	38000	55	35	0.282
385	Architectural Bronze	Cu 56.0 Pb 2.50 Zn Bal.	95	62000	24000	40	38000	55	85	0.305

Notes:

* Relative forgeability rating takes into consideration such variables as pressure, die wear and plasticity (hot). Since it is impractical to reduce these variables to units, calibration in terms of a percentage of the most generally used alloys, "Forging Brass" (100%), is considered the most practical basis for such ratings. The values shown represent the general opinion and are intended for information to enable the designer to better understand the forging characteristics of these various alloys.

**Machinability related to "Free Cutting Brass Rod" (100%).

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Copper Alloy Number	Commercial Designation	Physical Properties (cont)				Rating For***				Spec.
		Melting Point (Solidus) °F	Coeff. Thermal Exp. Per °F x 10 ⁻⁷	Thermal Cond. BTU / Ft.Hr.°F	Elec. Cond. % IACS at 68°F	Hot Working	Cold Working	Soft Soldering	Brazing	ASTM
377	Forging Brass	1620	115	69	27	E	P	E	G	B-283
365	Forging Brass	1620	115	69	27	E	P	E	G	B-283
642	Aluminum - Silicon Bronze	1800	N/A	26	8	G	G	N/R	F	B-283
464	Naval Brass	1630	118	67	26	E	F	E	G	B-283
485	Leaded Naval Brass	1630	118	67	26	E	P	E	G	B-283
675	Manganese Bronze Type A	1580	118	61	24	E	P	E	G	B-283
676	Leaded Manganese Bronze	1580	-	-	-	E	P	E	G	B-283
674	High Manganese Bronze	-	-	-	12	E	P	-	-	-
673	Leaded High Manganese Bronze	-	-	-	12	E	P	-	-	-
670	Manganese Bronze Type B	1735	-	-	12	E	P	-	-	-
385	Architectural Bronze	1610	116	71	27	E	P	-	-	-

Notes:

*** E = Excellent, G = Good, F = Fair, P = Poor, N/R = Not Recommended

Mechanical properties of any forging are influenced by shape and size. Unless otherwise specified in the purchase order or on the Cerro Fabricated Products drawing sent for your approval, acceptance of forgings will not be determined by tensile or hardness testing. The data in this table does not imply any warranty and are given for information only.